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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* THOMAS N. CHALIN, CULLY B. DODD and  
HERBERT D. HUDSON

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Appeal 2009-003373  
Application 10/600,049  
Technology Center 3600

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Decided<sup>1</sup>: July 6, 2009

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Before JAMESON LEE, RICHARD TORCZON and SALLY C. MEDLEY,  
*Administrative Patent Judges.*

MEDLEY, *Administrative Patent Judge.*

DECISION ON APPEAL

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<sup>1</sup> The two month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the decided date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

A. STATEMENT OF THE CASE

Watson & Chalin Manufacturing Inc. ("W&C"), the real party in interest, seeks review under 35 U.S.C. § 134(a) of a Final Rejection of claims 2-4, 13-21, 30-36, 38, 39 and 44. We have jurisdiction under 35 U.S.C. § 6(b). We affirm-in-part.

References Relied on by the Examiner

Aton	983,855	Feb. 7, 1911
Bradley	2,370,773	Mar. 6, 1945
Gimlett et al. ("Gimlett")	3,756,646	Sep. 4, 1973
VanDenberg	5,788,263	Aug. 4, 1998
Bria et al. ("Bria")	2001/0027890	Oct. 11, 2001

Rejections on Appeal

The Examiner rejected claims 30-31, 33, 36, 38 and 44 under 35 U.S.C. § 102(b) as anticipated by Bria.

The Examiner rejected claim 32 as unpatentable under 35 U.S.C. § 103(a) over Bria.

The Examiner rejected claims 2-4 as unpatentable under 35 U.S.C. § 103(a) over VanDenberg and Gimlett.

The Examiner rejected claims 13-21, 30-36, 38 and 44 as unpatentable under 35 U.S.C. § 103(a) over VanDenberg, Gimlett and Aton.

The Examiner rejected claim 39 as unpatentable under 35 U.S.C. § 103(a) over VanDenberg, Gimlett, Aton and Bradley.

W&C argues separately several different groups of claims, which shall become apparent in the analysis.

The Invention

W&C discloses a suspension system including an axle assembly that includes a composite axle portion and a spindle attached to the composite

axle portion. The suspension system includes at least two beams attached to the axle assembly. Spec. 2-3, 6-8.

Claim 30, reproduced from the Claim Appendix of the Appeal Brief, is as follows:

A suspension system, comprising:  
an axle assembly including a composite axle portion and a spindle attached to the composite axle portion, the spindle being configured to permit rotation of a wheel relative to the axle; and  
at least two beams attached to the axle assembly, the beams pivoting relative to a vehicle frame.

B. ISSUES

1. Has W&C shown that the Examiner incorrectly found that Bria's wheel hub that rotates together with an axle is "configured to permit rotation of a wheel relative to the axle"?
2. Has W&C shown that (1) the Examiner's rationale for combining the VanDenberg and Gimlett references was improper; and (2) VanDenberg teaches away from the combination?
3. Has W&C shown that the Examiner incorrectly found that the combination of VanDenberg and Gimlett describe a composite portion of an axle that extends between and through the beams?
4. Has W&C shown that the Examiner's rationale for combining the VanDenberg, Gimlett and Aton references was improper?
5. Has W&C shown that the Examiner incorrectly found that the combination of VanDenberg, Gimlett and Aton describe (1) sleeves secured exteriorly about the axle composite portion; (2) a sleeve at least partially overlying the composite axle portion; (3) the composite

axle portion is received within the spindle; and (4) the spindle is bonded to the composite axle portion?

6. Has W&C shown that the Examiner's rationale for combining the VanDenberg, Gimlett, Aton and Bradley references was improper?

C. FINDINGS OF FACT ("FF")

1. The term "relative" is defined as "[c]onsidered in comparison with something else". THE AM. HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE (4<sup>th</sup> ed. 2004).
2. A wide variety of composite materials have a corresponding wide variety of elastic moduli and are available for use.

Bria

3. Bria describes, referring to Bria's figure 7 reproduced below [numbers from figure 7 inserted], an axle assembly [149] including an axle [152], a pair of axle splines [153] (only one shown) mounted to the free end [152a] of the axle and a pair of hubs [154] mounted to the splines [153]. (¶ 102).

Bria's figure 7 is below:

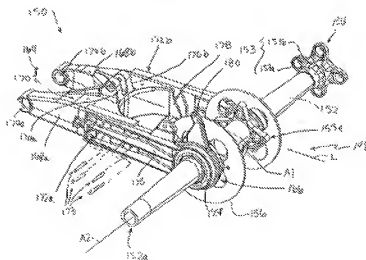


Figure 7 depicts an axle assembly.

4. The splines [153] include a collar portion [153a] that is bonded to the axle [152] and a radially extending portion [153b] integrally formed therewith. (¶ 103).
5. The central portion of the hub [154] can be removably joined to the radially extending portion [153b] of the spline [153] by bolts or the hub [154] can be integrally formed with the axle spline [153]. (¶ 103).
6. Rear wheels are connected to the hubs [154] using conventional lug nuts. (¶ 103).
7. The axle [152] can be formed of composite material. (¶¶ 105-106).

VanDenberg

8. VanDenberg describes, referring to VanDenberg's figure 3 reproduced below [numbers from figure 8 inserted], a vehicle suspension system including a pair of spaced-apart beams [15] that support an axle [19]. (Col. 5, ll. 20-26).

VanDenberg's figure 3 is below:

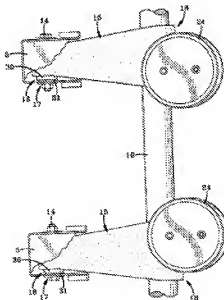


Figure 3 depicts a suspension assembly.

9. In figure 3, VanDenberg depicts the axle [19] as extending between, through and beyond the spaced-apart beams [15].
10. Beams [15] are formed of a plurality of layers of laminate material that extend around the axle [19]. (Col. 5, ll. 38-52).
11. The laminate material should have a modulus of elasticity in the range of from  $3.0 \times 10^6$  PSI -  $15 \times 10^6$  PSI and the axle has a modulus of elasticity in the range of  $28 \times 10^6$  PSI -  $30 \times 10^6$  PSI permitting the axle to move to an out-of-round condition and deflect relative to trailing beams [15] without causing the beam to fracture. (Col. 5, l. 64-col. 6, l. 18).
12. VanDenberg does not specifically describe how the wheels of the vehicle are connected to the axle [19].

Gimlett

13. Gimlett describes, referring to Gimlett's figure 1 reproduced below [numbers from figure 1 inserted], a wheelset comprising wheels [1] and an axle [2]. (Col. 1, ll. 49-50).

Gimlett's figure 1 is below:

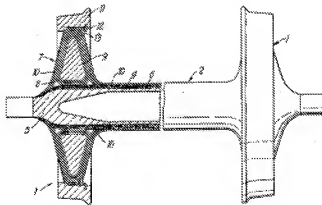


Figure 1 depicts a wheelset.

14. The axle [2] is built up by laying a resin wetted or pre-impregnated tape or woven fabric or by filament winding a resin wetted or pre-impregnated fibers onto a steel core [4]. (Col. 1, ll. 51-54).
15. The steel core [4] is formed by welding or suitably bonding pre-machined journal bearing sections [5] to the ends of a steel tube [6]. (Col. 1, ll. 54-56).
16. Additional fiber reinforcement [10] can be laid on the portion of the axle [2] between the wheel centers [7] and then over the outer face of the wheel center [7] to the axle [2], where it is blended into the surface. (Col. 2, ll. 9-19).
17. In figure 1, Gimlett depicts the portions of the journal bearing sections [5] of the steel core [4] located outside of the wheels [1] as not having resin wetted or pre-impregnated tape, fibers or woven fabric and not having additional fiber reinforcement [10].

Aton

18. Aton describes, referring to Aton's figure 3 reproduced below [numbers from figure 3 inserted], a removable spindle [1] that can be attached to an axle [2]. (Col. 1, ll. 34-38).

Aton's figure 3 is below:

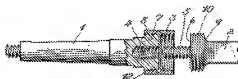


Figure 3 depicts an axle and a removable spindle.

19. The spindle [1] has an inner end with a flat face [3] and a central threaded recess [4] that accommodates a threaded stud [5] on the axle [2]. (Col. 1, ll. 45-50).



20. The axle [2] has an outer end that is provided with a flat face [6] that engages the spindle [1] flat face [3]. (Col. 1, ll. 50-53).
21. The inner portion [7] of the spindle [1] is externally threaded [8] and the end [9] of axle [2] is externally threaded [10]. (Col. 1, l. 55-col.2, l. 60).
22. A locking sleeve [12] is internally threaded [13], [14] and engages the external threads [8], [10] of the spindle [1] and axle [2]. (Col. 2, ll. 61-107).
23. Aton describes that the object of the invention is to provide a spindle which can be removed when worn and replaced by a new one thus saving the balance of the axle. (Col. 1, ll. 16-20).

Bradley

24. Bradley describes an axle assembly including a body and removable end spindles. (Col. 1, ll. 52-54).
25. A brake drum may be secured to a radial flange of a boss formed on each end of the body. (Col. 2, ll. 5-8, 39-40).

D. PRINCIPLES OF LAW

“[T]he PTO applies to the verbiage of the proposed claims the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art . . .” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997). “Although the PTO must give claims their broadest reasonable interpretation, this interpretation must be consistent with the one that those skilled in the art would reach.” *In re Cortright*, 165 F.3d 1353, 1358 (Fed. Cir. 1999).

The Supreme Court has rejected the rigid application of the “teaching suggestion or motivation” (TSM) test, instead favoring an “expansive and

flexible approach.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 415 (2007). It is not necessary to find precise teachings in the prior art directed to the specific subject matter claimed because inferences and creative steps that a person of ordinary skill in the art would employ can be taken into account. *Id.* at 418.

Based on its precedent, the Court reaffirmed the principle that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Id.* at 416.

The Court further explained that “if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.” *Id.* at 417. “A person of ordinary skill is also a person of ordinary creativity, not an automaton.” *Id.* at 421.

“The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.” *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

“Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references.” *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

In determining whether the subject matter of a claim is obvious, there is no requirement to look only to the problem that the applicant was trying to

solve. *KSR* at 419-420. “The question is not whether the combination was obvious to [applicant], but whether the combination was obvious to a person of ordinary skill in the art.” *Id.* at 420.

“[T]he ultimate determination of obviousness ‘does not require absolute predictability of success.... [A]ll that is required is a reasonable expectation of success.’” *Brown & Williamson Tobacco Corp. v. Phillip Morris Inc.*, 229 F.3d 1120, 1125 (Fed. Cir. 2000) (quoting *In re O’Farrell*, 853 F.2d 894, 903-904 (Fed Cir. 1988)).

“Under the proper legal standard, a reference will teach away when it suggests that the developments flowing from its disclosures are unlikely to produce the objective of the applicant’s invention.” *Syntex (U.S.A) v. Apotex, Inc.*, 407 F.3d 1371 (Fed. Cir. 2005), citing *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994).

“A [prior art] reference must be considered for everything it teaches by way of technology and is not limited to the particular invention it is describing and attempting to protect.” *EWP Corp. v. Reliance Universal Inc.*, 755 F.2d 898, 907 (Fed. Cir. 1985) (emphasis omitted). The use of patents as references is not limited to what the patentees describe as their own inventions or to the problems with which they are concerned, as they are a part of the literature and are relevant for all they contain. *In re Heck*, 699 F.2d 1331, 1333 (Fed. Cir. 1983), citing *In re Lemelson*, 397 F.2d 1006, 1009 (CCPA 1968).

#### E. ANALYSIS

##### Anticipation of claims 30, 31, 33, 36, 38 and 44 by Bria

Independent claim 30 recites (disputed limitations in italics): “an axle assembly including a composite axle portion and a spindle attached to the

composite axle portion, the spindle being *configured to permit rotation of a wheel relative to the axle . . .*” (Br. 34).

W&C and the Examiner disagree as to whether Bria describes a spindle which permits rotation of a wheel relative to the axle. (Br. 6; Final Rejection 6-7; Ans. 4, 8). The Examiner finds that Bria describes an axle [152] which can be made from a composite material and a spindle [154] (i.e., hub) attached to the composite axle [152] which is configured to permit rotation of a wheel relative to the axle. (Final Rejection 2; Ans. 3-4; *see* FF<sup>2</sup>s 3, 7). The Examiner further finds that the claim language “configured to permit rotation of a wheel relative to the axle” does not preclude a wheel that rotates with the axle. (Final Rejection 6-7; Ans. 4, 8). W&C argues that Bria describes that the wheels rotate with the axle, not relative to the axle. (Br. 6). We agree with W&C.

The Examiner does not dispute that a wheel mounted on Bria’s hub [154] rotates with the axle [152] due to the nature of its attachment to the axle [152]. (*See* FFs 4-6). However, the Examiner’s interpretation that the claim language does not preclude a wheel that rotates with the axle is not consistent with the interpretation that those skilled in the art would reach. The plain meaning of the term “relative” is defined as “considered in comparison with something else”. (FF 1). The plain meaning implies that there is a difference between two things being compared. The two things being compared are the rotation of the wheel and the axle. Since Bria’s wheel and axle are fixed, as acknowledged by the Examiner, then there is no relative rotation between the wheel and the axle. For these reasons, rotation

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<sup>2</sup> FF denotes Finding of Fact.

of a wheel *relative* to the axle can not reasonably be interpreted to mean that both the wheel and the axle rotate together.

For all these reasons, the Examiner erred in finding that claims 30, 31, 33, 36, 38, and 44 are anticipated by Bria.

Obviousness of Claim 32 over Bria

Claim 32 is ultimately dependent on claim 30. The Examiner's rationale for rejecting claim 32 does not make up for the deficiencies noted above with respect to claim 30. For the same reasons explained before with respect to claim 30, the Examiner erred in determining that claim 32 would have been obvious over Bria.

Obviousness of Claim 2 over VanDenberg and Gimlett

Independent claim 2 recites (disputed limitations in *italics*): “an axle, at least a portion of the axle being made of a *composite material*; and at least two beams attached to the axle . . . .” (Br. 30).

The Examiner finds that VanDenberg describes an axle [19] with at least two beams [15] attached to the axle. (Final Rejection 3; Ans. 5; *see* FF 8). The Examiner does not rely on VanDenberg for describing an axle of composite material. (Final Rejection 4; Ans. 5). Instead, the Examiner finds that Gimlett teaches the use of an axle where at least a portion of the axle is made of composite material. (Final Rejection 4; Ans. 5; *see* FFs 13-14). Gimlett describes an axle [2] covered by composite material along nearly the entire length of its peripheral surface except for the extreme ends [5] of the axle [2]. (FFs 13-17). The Examiner determined that it would have been obvious to one with ordinary skill in the art at the time the invention was made to form at least a portion of VanDenberg's axle from composite material in order to reduce the weight of the axle, and therefore the entire

assembly, without sacrificing the strength characteristics of a solid steel axle. (Final Rejection 4; Ans. 5).

W&C does not dispute the Examiner's findings. Instead, W&C argues that neither VanDenberg nor Gimlett provides a suggestion or motivation for a person skilled in the art to make the invention of claim 2 or suggests any desirability of the combination. (Br. 10-11). In an obviousness analysis, it is not necessary to find precise teachings in the prior art directed to the specific subject matter claimed. Inferences and creative steps that a person of ordinary skill in the art would have used can be taken into account. Based on the record before us, at the time the invention was made, it would have been obvious to one with ordinary skill in the art to substitute a composite covered axle as taught by Gimlett for VanDenberg's axle. The substitution of one element for another known in the field is obvious unless it does more than yield a predictable result. W&C does not direct us to evidence to demonstrate that substituting an axle of composite material as taught by Gimlett for VanDenberg's axle would yield an unpredictable result or would be beyond the skill level of one of ordinary skill in the art.

W&C also argues that there is no explanation of how Gimlett's rotating axle could be attached to VanDenberg's pivoting beam. (Br. 10-11). W&C's argument is misplaced. The test for obviousness is not whether the features of a secondary reference (i.e., the rotating axle) can be bodily incorporated into the structure of the primary reference (i.e., the pivoting beam). The test is what the combined teachings would have suggested to those of ordinary skill in the art.

Last, W&C argues that VanDenberg teaches away from the combination. W&C argues that VanDenberg teaches that its pivoting beams

should have a modulus of elasticity which is significantly less than that of the axle. (Br. 11). W&C argues that this teaching suggests that the beam, not the axle should be constructed of composite material. (Br. 11). W&C's arguments are rejected.

VanDenberg's teaching that the beams [15] should have a modulus of elasticity less than that of the axle [19] does not amount to a teaching away from an axle of composite material. VanDenberg's teaching does not foreclose the use of a composite material for the axle [19] because it does not suggest that developments flowing from its disclosure would be unlikely to produce a composite axle. Substituting a composite material for the material of VanDenberg's axle [19] would not necessarily result in beams [16] having a modulus of elasticity greater than the axle [19]. A wide variety of composite materials having a corresponding wide variety of elastic moduli are available for use. (FF 2). A person of ordinary skill in the art could choose from a variety of available and suitable composite materials for the axle [19] while remaining compliant with VanDenberg's elasticity modulus requirements. Moreover, "[a] [prior art] reference must be considered for everything it teaches by way of technology and is not limited to the particular invention it is describing and attempting to protect." *EWP*. The intended purpose of VanDenberg need not be preserved. The use of patents as references is not limited to what the patentees describe as their own inventions or to the problems with which they are concerned, as they are a part of the literature and are relevant for all they contain. *Heck*.

For all these reasons, W&C has not shown that the Examiner erred in determining that claim 2 would have been obvious over the prior art.

Obviousness of Claims 3-4

Claims 3 and 4 are both dependent on claim 2. Claim 3 further recites: “the axle portion extends at least between the beams.” (Br. 30). Claim 4 further recites: “the axle portion extends through each of the beams.” (Br. 30).

W&C argues that neither VanDenberg nor Gimlett contain any teachings or suggestions that a composite portion of an axle should extend between the beams or extend through each of the beams. (Br. 12-13). W&C’s arguments are unpersuasive. VanDenberg depicts an axle [19] that extends between, through and beyond the spaced-apart beams [15]. (FF 9). Gimlett describes an axle [2] covered by composite material along nearly the entire length of its peripheral surface except for the extreme ends [5] of the axle [2]. (FFs 13-17). The substitution of an axle covered in composite material as described by Gimlett for VanDenberg’s axle results in an axle which extends between and through the beams which is also covered by composite material along nearly the entire length of its peripheral surface including the axle portion that extends between and through the beams. W&C does nothing more than substitute one element for another known element. W&C does not direct us to evidence to demonstrate that doing so would have yielded unpredictable results or would have been beyond those skilled in the art.

For all these reasons, W&C has not shown that the Examiner erred in determining that claims 3-4 would have been obvious over the prior art.

Obviousness of Claim 30 over VanDenberg, Gimlett and Aton

Independent claim 30 recites (disputed limitations in *italics*): “an axle assembly including a composite axle portion and *a spindle attached to the*



*composite axle portion . . . ; and at least two beams attached to the axle assembly . . . .*” (Br. 34).

In addition to the findings and determinations with respect to the VanDenberg and Gimlett explained before, the Examiner finds that Aton describes an axle assembly including a spindle [1] attached to the axle [2]. (Final Rejection 4; Ans. 5; *see* FF 18). The Examiner determined that it would have been obvious to one with ordinary skill in the art at the time the invention was made to form the composite axle of VanDenberg and Gimlett with the physical features, such as the spindle, of Aton in order to allow a plurality of different types and sizes of wheels to be used on the vehicle, while allowing replacement of the spindles in the event of damage to the spindles. (Final Rejection 4-5; Ans. 5-6).

W&C presents identical arguments directed to the VanDenberg and Gimlett references for claim 30 as those presented for claim 2. (*Compare* Br. 20-21 with Br. 10-11). For the same reasons as explained before with respect to claim 2, W&C’s arguments are unpersuasive.

W&C additionally argues that the Aton reference contains no teaching whatsoever of the spindle [1] being attached to a composite portion of the axle [2]. (Br. 21). W&C’s arguments are rejected. W&C’s arguments attack the Aton reference separately rather than addressing the combined teachings of VanDenberg, Gimlett and Aton. “Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references.” *Merck*, 800 F.2d at 1097.

W&C also argues that the only axle composite portion is found in the Gimlett reference which has no use for a spindle since Gimlett’s axle and

wheels rotate together as an integral assembly. (Br. 21). W&C concludes that there is no motivation to make the combination as proposed by the Examiner. (Br. 21).

W&C's arguments focus on Gimlett's described invention alone. That focus is too narrow. "A [prior art] reference must be considered for everything it teaches by way of technology and is not limited to the particular invention it is describing and attempting to protect." *EWP*. As explained before, in an obviousness analysis it is not necessary to find precise teachings in the prior art directed to the specific subject matter claimed because inferences and creative steps that a person of ordinary skill in the art would employ can be taken into account.

As already explained, one with ordinary skill in the art would have known how to substitute an axle covered by composite material along nearly the entire length of its peripheral surface as taught by Gimlett for VanDenberg's axle. Aton describes a removable spindle [1] that can be attached to an axle [2]. (FF 18). As explained by the Examiner, using a removable spindle allows different types and sizes of wheels to be used on a vehicle, while allowing replacement of the spindles in the event of damage to the spindles. (Final Rejection 4-5; Ans. 6). Aton describes that providing a removable spindle with an axle enables the spindle to be removed when worn and replaced by a new spindle, thus saving the balance of the axle. FF 23. At the time of the invention, it would have been obvious to one with ordinary skill in the art to modify the suspension system of VanDenberg and Gimlett to include a removable spindle as taught by Aton since it would offer flexibility in the sizes and types of wheels to be used on the vehicle axle. Moreover, the substitution of one element for another known in the

field and the combination of familiar elements according to known methods is obvious when it does no more than yield a predictable result. W&C does not direct us to evidence to demonstrate that the combination of VanDenberg, Gimlett and Aton yields an unpredictable result or would be beyond the skill level of one of ordinary skill in the art.

The combination of VanDenberg, Gimlett and Aton results in an axle that is covered by composite material along nearly the entire length of its peripheral surface but is not necessarily covered by composite material at its ends where the axle contacts the spindle. However, the claim language does not require direct contact or direct attachment of the spindle to the composite axle portion. The claim language is broad enough to permit the composite axle portion (i.e., nearly the entire length of the axle peripheral surface) to be attached to the spindle by way of the extreme ends of the axle that are not covered in composite material.

For all these reasons, W&C has not shown that the Examiner erred in determining that claim 30 would have been obvious over VanDenberg, Gimlett and Aton.

#### Obviousness of Claim 44

Claim 44 is dependent on claim 30. Similar to claim 4 addressed before, claim 44 further recites: “the composite axle portion extends through the beams.” (Br. 36). W&C’s arguments are similar to those made in connection with claim 4.

For the same reasons explained before in addressing claim 4, W&C has not shown that the Examiner erred in determining that claim 44 would have been obvious over VanDenberg, Gimlett and Aton.

Obviousness of Claim 39 over VanDenberg, Gimlett, Aton and Bradley

Claim 39 is dependent on claim 30 and further recites: “a brake mounting attached to the spindle.” (Br. 35).

In addition to the findings and determinations with respect to the VanDenberg, Gimlett and Aton references explained before for claim 30, the Examiner finds that the combination of references does not describe a spindle including a brake mounting. (Final Rejection 6; Ans. 7). The Examiner finds that Bradley teaches the use of a spindle that includes a brake mounting attached to the spindle. (Final Rejection 6; Ans. 7; *see* FFs 24-25). The Examiner determined that it would have been obvious to one with ordinary skill in the art at the time the invention was made to modify VanDenberg, Gimlett and Aton to provide a brake mounting attached to the spindle for the purpose of allowing a brake element and/or a wheel to be mounted onto the spindle, as is well known in the art. (Final Rejection 6; Ans. 7).

W&C presents identical arguments directed to the VanDenberg, Gimlett, Aton and Bradley references for claim 39 as those directed to the VanDenberg, Gimlett and Aton references presented for claim 30. (*Compare* Br. 27 with Br. 20-21). For the same reasons as explained before with respect to claim 30, W&C’s arguments are unpersuasive.

In addition, W&C argues that it is unclear how the attachment methods described by Bradley (i.e., wedging a spindle into an end of an axle body section and riveting a brake drum to the axle body section) would work with a composite axle portion. (Br. 27). W&C argues that it is unclear whether Bradley’s attachment methods would work “because none of the references has explained how the problems of incorporating a composite

portion of an axle into a pivoting beam-type suspension system could be accomplished". (Br. 27).

W&C's arguments are misplaced. The Examiner does not rely on Bradley to describe incorporating a composite axle into a pivoting beam-type suspension system. Rather, the Examiner relies on Bradley for teaching a brake mounting attached to a spindle. (Final Rejection 6; Ans. 7; see FFs 24-25).

We further understand W&C to argue that none of the references address the same problem as W&C and that there would be no expectation of success in combining the references to result in the claimed invention. W&C's arguments are unpersuasive. In determining whether the subject matter of a claim is obvious, there is no requirement to look only to the problem that the applicant was trying to solve. Furthermore, there is no requirement for absolute predictability of success in the determination of whether the claimed subject matter would have been obvious. All that is required is a reasonable expectation of success. Based on Gimlett's description of using an axle comprising composite material (FF 14), one with ordinary skill in the art would have had a reasonable expectation of success in using axles of composite material for other applications. W&C also does not direct us to objective evidence to demonstrate that one with ordinary skill in the art would not have had a reasonable expectation of success in combining the teachings of the VanDenberg, Gimlett, Aton and Bradley references.

For all these reasons, W&C has not shown that the Examiner erred in determining that claim 39 would have been obvious over VanDenberg, Gimlett, Aton and Bradley.

Obviousness of Claims 13-21 and 31-35 over VanDenberg, Gimlett and Aton

Claim 13 is dependent on claim 2 and further recites: “at least two metal sleeves secured exteriorly about the axle composite portion”. (Br. 31). Similarly, claim 31 is dependent on claim 30 and further recites: “the spindle is attached to a sleeve at least partially overlying the composite axle portion”. (Br. 34).

In addition to the findings and determinations with respect to VanDenberg, Gimlett and Aton explained before, the Examiner finds that Aton teaches an axle assembly including an axle [2] and a spindle [1] attached to a sleeve [12] that at least partially overlies the axle [2]. (Final Rejection 4; Ans. 5; *see* FFs 18-22). The Examiner finds that Aton’s axle [2] would include at least two metal sleeves [12] secured exteriorly about the axle [2]. (Final Rejection 4; Ans. 5-6). The Examiner determined that it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the composite axle of VanDenberg as modified by Gimlett with the physical features such as the spindles and sleeves of Aton in order to allow a plurality of different types and sizes of wheels to be used on the vehicle while allowing replacement of the spindles in the event of damage. (Final Rejection 4-5; Ans. 6).

Specific to claim 13, W&C argues that the claim language does not merely recite two metal sleeves, but recites a particular arrangement of the elements of the suspension system. (Br. 13). W&C also argues that neither the combination of references nor Aton provide any teaching or suggestion that Aton’s sleeves be positioned in any particular manner relative to a composite portion of the axle. (Br. 13-14). Specific to claim 31, W&C

argues that the claim language does not recite a specific attachment between the spindle and the composite axle portion and that the Examiner erred in addressing this limitation. (Br. 21).

W&C's arguments are persuasive. The Examiner does not direct us to, and we can not find where the references describe securing the metal sleeves exteriorly about the *composite axle portion* or a sleeve at least partially overlying the *composite axle portion*. VanDenberg is silent as to how the axle [19] is connected to the wheels of the vehicle. (FF 12). Aton describes an axle [2] attached to a spindle [1] which includes a locking sleeve [12] secured exteriorly about the inner portion [7] of the spindle [1] and the end [9] of the axle [2]. (FFs 18-22). Gimlett describes an axle [2] covered by composite material along nearly the entire length of its peripheral surface except for the extreme ends [5] of the axle [2]. (FFs 13-17). The combination of references does not describe that the ends of the axle upon which the sleeves partially overlie or are exteriorly secured, include composite material. In fact, the combination of references teaches that the ends of the axle are not covered in composite material because Gimlett describes an axle [2] covered by composite material along nearly the entire length of its peripheral surface except the extreme ends [5] of the axle [2]. (FFs 13-17). In addition, the Examiner does not provide a reason why it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify VanDenberg, Gimlett and Aton, such that the entire length of the axle comprises composite material, including the ends of the axle upon which the sleeves at least partially overlie or are exteriorly secured.

For all these reasons, the Examiner erred in determining that claims 13 and 31 would have been obvious over VanDenberg, Gimlett and Aton.

Claims 14-21 and 32-35 are ultimately dependent on claims 13 and 31 respectively. For the same reasons explained before with respect to claims 13 and 31, the Examiner erred in determining that claims 14-21 and 32-35 would have been obvious over VanDenberg, Gimlett and Aton.

Obviousness of Claims 36 and claim 38

Claims 36 and 38 are dependent on claim 30. Claim 36 further recites “the composite axle portion is received within an interior of the spindle.” Claim 38 further recites “the spindle is bonded to the composite axle portion.” (Br. 35).

Similar to our analysis before addressing claims 13-21 and 31-35, the Examiner does not direct us to, and we can not find where the combination of Vandenberg, Gimlett and Aton describe a composite axle portion bonded to or received within an interior recess of the spindle. VanDenberg is silent as to how the axle [19] is connected to the wheels of the vehicle. (FF 12). Aton describes an axle [2] including a threaded stud [5] that is frictionally bonded to and received within an interior threaded recess [4] of the spindle [1]. (FFs 18-19). Gimlett describes an axle [2] covered by composite material along nearly the entire length of its peripheral surface except for the extreme ends [5] of the axle [2]. (FFs 13-17). The combination of references does not describe that the threaded stud [5] or extreme end of the axle includes composite material. In fact, the combination of references teaches that the ends of the axle are not covered in composite material because Gimlett describes an axle [2] covered by composite material along nearly the entire length of its peripheral surface except for the extreme ends



[5] the axle [2]. (FFs 13-17). The Examiner also does not address whether it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify VanDenberg, Gimlett and Aton, such that the entire length of the axle comprises composite material, including the threaded stud [5] that is received in and frictionally bonded to the spindle [1].

For all these reasons, the Examiner erred in determining that claims 36 and 38 would have been obvious over VanDenberg, Gimlett and Aton.

F. CONCLUSION

1. The Examiner incorrectly found that Bria's wheel hub that rotates together with the axle is "configured to permit rotation of a wheel relative to the axle".
2. W&C has not shown that (1) the Examiner's rationale for combining the VanDenberg and Gimlett references was improper; and (2) VanDenberg teaches away from the combination.
3. W&C has not shown that the Examiner incorrectly found that the combination of VanDenberg and Gimlett describe a composite portion of an axle that extends between and through the beams.
4. W&C has not shown that the Examiner's rationale for combining the VanDenberg, Gimlett and Aton references was improper.
5. The Examiner incorrectly found that the combination of VanDenberg, Gimlett and Aton describe (1) sleeves secured exteriorly about the axle composite portion; (2) a sleeve at least partially overlying the composite axle portion; (3) the composite axle portion is received within the spindle; and (4) the spindle is bonded to the composite axle portion.

6. W&C has not shown that the Examiner's rationale for combining the VanDenberg, Gimlett, Aton and Bradley references was improper.

G. ORDER

The decision of the Examiner rejecting claims 30-31, 33, 36, 38 and 44 as under 35 U.S.C. § 102(b) as anticipated by Bria is reversed.

The decision of the Examiner rejecting claim 32 as unpatentable under 35 U.S.C. § 103(a) over Bria is reversed.

The decision of the Examiner rejecting claims 2-4 as unpatentable under 35 U.S.C. § 103(a) over VanDenberg and Gimlett is affirmed.

The decision of the Examiner rejecting claims 13-21, 31-36 and 38 as unpatentable under 35 U.S.C. § 103(a) over VanDenberg, Gimlett and Aton is reversed.

The decision of the Examiner rejecting claims 30 and 44 as unpatentable under 35 U.S.C. § 103(a) over VanDenberg, Gimlett and Aton is affirmed.

The decision of the Examiner rejecting claim 39 as unpatentable under 35 U.S.C. § 103(a) over VanDenberg, Gimlett, Aton and Bradley is affirmed.

No time period for taking any subsequent action in connection with the appeal may be extended under 37 C.F.R. § 1.136(a).

**AFFIRMED-IN-PART**

sss

Appeal 2009-003373  
Application 10/600,049

SMITH IP SERVICES, P.C.  
P.O. Box 997  
Rockwall, TX 75087

<i>Notice of References Cited</i>	Application/Control No. 10/600,049	Applicant(s)/Patent Under Patent Appeal No. 2009-003373	
	Examiner Jason Bellinger	Art Unit 3600	Page 1 of 1

**U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
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**NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	The Am. Heritage Dictionary of the English Language (4 <sup>th</sup> ed. 2004).
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
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**rel-a-tive**  [rel-uh-tiv]  Show IPA

—*noun*

1. a person who is connected with another or others by blood or marriage.
2. something having, or standing in, some relation to something else.
3. something dependent upon external conditions for its specific nature, size, etc. (opposed to **ABSOLUTE** ).
4. *Grammar.* a relative pronoun, adjective, or adverb.

—*adjective*

5. considered in relation to something else; comparative: *the relative merits of democracy and monarchy.*
6. existing or having its specific nature only by relation to something else; not absolute or independent: *Happiness is relative.*
7. having relation or connection.
8. having reference or regard; relevant; pertinent (usually fol. by *to*): *to determine the facts relative to an accident.*
9. correspondent; proportionate: *Value is relative to demand.*
10. (of a term, name, etc.) depending for significance upon something else: *"Better" is a relative term.*
11. *Grammar.*
  - a. noting or pertaining to a word that introduces a subordinate clause of which it is, or is a part of, the subject or predicate and that refers to an expressed or implied element of the principal clause (the antecedent), as the relative pronoun *who* in *He's the man who saw you* or the relative adverb *where* in *This is the house where*

## Synonyms

conditional  
conditioned  
contingent  
reliant  
subject  
kin  
kinsman  
kinswoman  
relation  
about  
allied  
analogous

More Synonyms»

## Nearby Entries

relationist  
relationless  
relation  
relationship